

U.S. Patent Application Serial No. 10/594,868

Amendment dated December 23, 2010

Reply to Office Action of September 23, 2010

REMARKS

This paper is being submitted in response to the Office Action mailed September 23, 2010. Claims 1–7 and 9–13 are currently pending, with claim 8 previously cancelled without prejudice and claims 14–20 previously withdrawn as drawn to a non-elected invention. No new matter is introduced by this Amendment.

Rejection under 35 U.S.C. § 102

Claims 1–4, 7 and 12 were rejected under 35 U.S.C. § 102(b) as anticipated by Fraunhofer ("Fraunhofer ISC Annual Report 2003," Germany: Fraunhofer ISC, 2004, herein after "Fraunhofer"). Applicants respectfully traverse the rejection.

For a printed publication to constitute anticipatory prior art under 35 U.S.C. § 102(b), the printed publication must disclose every element of the claims more than one year prior to the filing date of the patent application. *See, e.g., Hakim v. Cannon Avent Group, PLC*, 479 F.3d 1313, 1319 (Fed. Cir. 2007). Applicants submit Fraunhofer is not prior art under 35 U.S.C. § 102(b), as its publication date is after the priority date of the present Application.

Applicants enclose herewith evidence demonstrating the actual publication date of the Fraunhofer reference was after April 14, 2004, and therefore, after the March 31, 2004 filing date of EP04007735, to which the present Application claims priority (*see* Attachment A). Although the preface of the Fraunhofer reference indicates a publication date of January 2004, the evidence submitted herewith indicates the reference was not published or delivered in print until after April 14, 2004, and therefore, did not exist as a printed publication prior to this date. Furthermore, the online version of the reference was not published on the Fraunhofer ISC website until after the publication and delivery of the printed copies, i.e. after April 14, 2004.

As Fraunhofer is not a proper prior art reference under 35 U.S.C. § 102(b), the rejection of the claims as anticipated by Fraunhofer is unwarranted, and Applicants respectfully request withdrawal of the same.

Rejection under 35 U.S.C. § 103

1. Claims 5, 6, 10–11 and 13 were rejected under 35 U.S.C. § 103(a) as obvious over Fraunhofer in view of Goodwin et al. (WO03/086031). Applicants respectfully traverse the rejection.

Without acquiescing in the rejection or in the Examiner's characterization of the claims, Applicants submit, as detailed above, that Fraunhofer is not available as a prior art reference under 35 U.S.C. § 102(b), and therefore, the reference cannot be combined with Goodwin et al. to form the basis of an obviousness rejection. Therefore, the rejection of the claims under 35 U.S.C. §103 is not warranted, and Applicants respectfully request withdrawal of the rejection.

2. Claim 9 was rejected under 35 U.S.C. § 103(a) as obvious over Fraunhofer in view of Haas (*Surface and Coatings Technology* 111 (1999), 72–79)). Applicants respectfully traverse the rejection.

Without acquiescing in the rejection or in the Examiner's characterization of the claims, Applicants submit, as detailed above, that Fraunhofer is not available as a prior art reference under 35 U.S.C. § 102(b), and therefore, the reference cannot be combined with Haas to form the basis of an obviousness rejection. Therefore, the rejection of the claims under 35 U.S.C. §103 is not warranted, and Applicants respectfully request withdrawal of the rejection.

3. Claims 1–7 and 9–13 were rejected under 35 U.S.C. § 103(a) as obvious over Goodwin et al. (WO 03/086031) in view of Swihart et al. (U.S. Patent No. 4,447,499). Applicants respectfully traverse the rejection.

Goodwin et al. disclose an atmospheric pressure plasma assembly and methods for treating a substrate using the disclosed assembly (*see generally* Goodwin et al., at [00011]). The reference describes an atmospheric DBD (dielectric barrier discharge) plasma process where liquid droplets produced by atomizing a liquid and/or solid are introduced into an atmospheric glow discharge. The atomized liquid includes monomers, oligomers, metal alkoxides, metals, metal oxides or conducting polymers (*see, e.g.*, Goodwin et al., at [0019]).

U.S. Patent Application Serial No. 10/594,868

Amendment dated December 23, 2010

Reply to Office Action of September 23, 2010

Swihart et al. describe adhesive-releasing silicone coatings, and methods for applying the coatings to substrate. The coating composition includes a polydiorganosiloxane compound of the formula $R_3SiO(MeQSiO)_x(Me_2SiO)_ySiR_3$, and a UV-radiation photosensitizer soluble in the polydiorganosiloxane (*see* Swihart et al., at col. 2, ll. 45–67). The composition is applied to the substrate and then cured by applying UV radiation. Swihart et al. also disclose paper and polymer materials coated by the methods of the invention (*see id.*, at col. 3, ll. 4–5).

Claim 1 recites a method for coating a substrate with an inorganic-organic hybrid polymer material using the Dielectric Barrier Discharge (DBD) technique. The method includes steps of introducing a sample in the space between two electrodes, controlling the atmosphere between the electrodes, generating a plasma discharge between the electrodes, and mixing aerosols containing hybrid organic/inorganic cross-linked pre-polymers formed via sol-gel processing, into the plasma discharge.

To make a *prima facie* case of obviousness, the teachings of the prior art should have suggested the claimed subject matter to the person of ordinary skill in the art, and all the claim limitations must be taught or suggested in the references cited by the Examiner. *In re Kotzab*, 217 F.3d 1365, 1370 (Fed. Cir. 2000). As articulated by the Supreme Court in a recent case, a combination is obvious if it is no more than the predictable use of known elements according to their established functions; and there was a reason to combine the known elements. *KSR Intl Co. v. Teleflex, Inc.*, 550 U.S. 398 (2007). To make a *prima facie* case of obviousness, "it remains necessary to identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed." *Id.* The initial burden to make a *prima facie* case of obviousness is on the Examiner. *In re Bell*, 991 F.2d 781, 783 (Fed. Cir. 1993). Applicants submit that the Examiner does not make a *prima facie* case of obviousness, because all the limitations of the present claims are not taught by the reference cited in the Office Action.

The Examiner contends that Goodwin et al. teach using different precursors depending on the desired film, and characterizes the disclosed polydimethylsiloxane precursor as a hybrid inorganic/organic pre-polymer. Applicants respectfully disagree with this contention, and submit that the polydimethyl siloxane material is not a prepolymer. Goodwin et al. specifically describe polydimethylsiloxane as a linear siloxane, and although it is a precursor for layer formation, the

U.S. Patent Application Serial No. 10/594,868

Amendment dated December 23, 2010

Reply to Office Action of September 23, 2010

polydimethylsiloxane does not undergo further polymerization, and is therefore not a prepolymer. A prepolymer is defined in the art as a "polymer or oligomer, the molecules of which are capable of entering, through reactive groups, into further polymerization and thereby contributing more than one structural unit to at least one type of chain of the final polymer" (see, e.g., "IUPAC Recommendations 2003", Pure & Applied Chemistry, vol. 76, 889 (2004)). There is no indication in Goodwin et al. that any of the materials described therein are capable of entering, through reactive groups, into further polymerization and thereby contributing more than one structural unit to at least one type of chain of a final polymer. Therefore, as the polymethylsiloxane precursor (or any other material described in Goodwin et al) does not fall within the accepted definition of a prepolymer, it cannot be described as a hybrid inorganic/organic prepolymer, as recited in the present claims.

Moreover, Goodwin et al. fail to teach or suggest cross-linked polymers. Cross-links are covalent or ionic bonds that link one pre-existing polymer chain to another. When polymer chains are joined together by cross-links, they lose some of their ability to move as individual polymer chains. None of the polymers disclosed in Goodwin et al. (see, e.g., Goodwin et al., at [0011]) appear to be cross-linked. Therefore, Goodwin et al. fail to teach or suggest a hybrid inorganic/organic cross-linked prepolymer, as recited in the present claims.

A sol-gel material is a possible outcome of a cross-linking process, so processing by sol-gel means limits cross-linked materials to those hybrid organic/inorganic cross-linked prepolymers capable of forming sol-gels. There is no indication in Goodwin et al. that injection of hybrid inorganic/organic cross-linked prepolymers via sol-gel processing would result in materials with the desired properties, and therefore, a person of skill in the art would not be motivated to inject this type of material into the plasma as recited in the present claims.

The Examiner concedes that Goodwin does not teach how the polydimethyl siloxane precursors are made. Instead, the Examiner cites Swihart, noting that Swihart teaches that these precursors can be made by conventional methods. Applicants submit that the failure of Goodwin et al. to teach how the precursors are made is moot in view of the above remarks, which clearly demonstrate that Goodwin et al. disclose only the injection of monomers, oligomers, metal

U.S. Patent Application Serial No. 10/594,868

Amendment dated December 23, 2010

Reply to Office Action of September 23, 2010

oxide, metal alkoxide or metals into a DBD plasma, and not the injection of hybrid inorganic/organic cross-linked prepolymers formed via sol-gel processing into a plasma.

Applicants submit that Swihart et al. do not cure the deficiencies of Goodwin et al. Swihart et al. describe methods for coating substrates using polydiorganosiloxanes. By their very nature, these materials are only able to form linear polymers. They contain no reactive functional groups that can be used to form cross-links between linear chains. Moreover, hydrolysis or condensation of dimethylsilanes produces only linear chains, whereas a sol-gel process would require cross-linking, which the materials in Swihart et al. are incapable of doing. A person of skill in the art would therefore not be motivated to use the materials described in Swihart et al. in a sol-gel processing method to arrive at the method described in the present claims. Therefore, the combination of Goodwin et al. and Swihart et al. fails to teach or suggest a method including the injection of hybrid inorganic/organic cross-linked prepolymers formed via sol-gel processing into a plasma, as recited in the present claims.

In view of the foregoing, Applicants submit the Examiner has failed to make a *prima facie* case of obviousness, as all the limitations of the present claims are not taught in the combination of Goodwin and Swihart references. Therefore, the rejection of claim 1 as obvious over the combination of Goodwin and Swihart is unwarranted, and withdrawal of the same is respectfully requested. Claims 2–7 and 9–13 depend from claim 1 and incorporate all the limitations thereof. Since claim 1 is not *prima facie* obvious over the combination of Goodwin and Swihart, claims 2–7 and 9–13 are also not obvious, and withdrawal of the rejection with respect to these claims is respectfully requested.

4. Claim 3 was additionally rejected under 35 U.S.C. 103(a) as obvious over Goodwin et al. in view of Swihart et al. as applied to claim 1, further in view of Chow et al. (U.S. Patent Pub. No. 2002/0031658). Applicants respectfully traverse the rejection.

The above discussion of Goodwin et al. and Swihart et al. is fully incorporated herein. Briefly, the combination of Goodwin et al. and Swihart et al. do not render claim 1 *prima facie* obvious, because the method of the present claims is not taught or suggested in Goodwin and Swihart, as the combination of references does not teach or suggest methods including injection

U.S. Patent Application Serial No. 10/594,868

Amendment dated December 23, 2010

Reply to Office Action of September 23, 2010

of hybrid inorganic/organic cross-linked prepolymers formed via sol-gel processing into a plasma.

Claim 3 recites the method of claim 1, where the aerosol includes a compositional gradient of the pre-polymers and/or any additional admixed components. The claim depends directly from claim 1 and incorporates all the limitations of that claim.

The Examiner concedes that the combination does not teach or suggest the formation of multilayer coatings in a plasma treatment, and cites Chow et al. for the missing teaching. Applicants submit that Chow et al. do not cure the deficiencies of Goodwin and Swihart.

Chow et al. describe spray deposition of liquid precursor coating material onto a substrate (*see* Chow et al., at paragraphs [0013]). The methods in Chow et al. are described as “suitable for producing multilayer materials.” A fine composition gradient can be formed by varying the composition of the precursor composition (*see id.*, at Abstract and paragraph [0027]).

However, Chow et al. do not teach or suggest the invention of claim 3, as the reference does not cure the deficiencies of Goodwin et al. and Swihart et al. with respect to claim 1. Specifically, there is nothing in Chow et al. that would suggest methods including hybrid inorganic/organic cross-linked prepolymers formed via sol-gel processing into a plasma. The combination of references fails to teach or suggest all the limitations of the method of claim 1.

In view of the above remarks, claim 3, which depends directly from claim 1 and incorporates all limitations thereof, is not *prima facie* obvious under 35 U.S.C. § 103(a) over Goodwin et al. and Swihart et al. in view of Chow et al. The rejection is not warranted, and withdrawal of the same is respectfully requested.

U.S. Patent Application Serial No. 10/594,868

Amendment dated December 23, 2010

Reply to Office Action of September 23, 2010

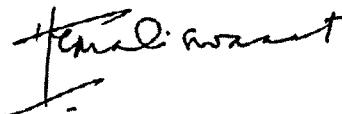
SUMMARY

In view of the above amendments and remarks, Applicant respectfully requests a Notice of Allowance. If the Examiner believes a telephone conference would advance the prosecution of this application, the Examiner is invited to telephone the undersigned at the below-listed telephone number.

Please consider this a PETITION FOR EXTENSION OF TIME for a sufficient number of months to enter these papers or any future reply, if appropriate. Please charge any additional fees or credit overpayment to Deposit Account No. 13-2725.

Respectfully submitted,

MERCHANT & GOULD P.C.
P.O. Box 2903
Minneapolis, Minnesota 55402-0903
(612) 332-5300



Date: December 23, 2010



Hema L. Viswanathan
Reg. No. 62,932
GAS:HLV:jrm



Fraunhofer
ISC

Fraunhofer ISC | Neuerplatz 2 | 97082 Würzburg

VITO - Materials Department
Dr. Dirk Vangeneugden
Boeretang 200
2400 Mol
Belgium

Fraunhofer-Institut für
Silicatforschung ISC

Director
Prof. Dr. Gerhard Sextl

Neuerplatz 2
97082 Würzburg

Marie-Luise Righi
Marketing and Communications
Phone + 49 931 4100-150 | Fax -399
righi@sc.fraunhofer.de
www.isc.fraunhofer.de

Würzburg, 18 June 2010

Publication date of the Annual Report 2003 in the year 2004

To whom it may concern

This is to certify that the Annual Report 2003 of the Fraunhofer-Institut für Silicatforschung ISC was not published until after 14 April 2004.

It was on 14 April 2004 that the printing company delivered the actual printed copies of the Annual Report 2003 to our premises (attached please find a copy of the invoice from the printing shop Weigang Media GmbH, stating the date of delivery to be 14.04.2004 (on top, right hand side)). Mailing did not begin until 30 April 2004.

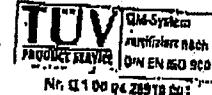
An electronic version of the Annual Report 2003 was not published on our website until acceptance of the printed copies, i.e. after 14 April 2004.

Marie-Luise Righi
Head of Marketing and Communications

Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V., München
Executive Board:
Univ.-Prof. Dr.-Ing. habil. Prof. e.h. mult. Dr. h.c. mult. Hans-Jörg Bullinger, President
Prof. Dr. rer. nat. Ulrich Boller
Prof. (Univ. Stellenbosch) Dr. rer. pol. Alfred Gossner

Cheques and transfers payable to:
Deutsche Bank, München
Account 752193300 BLZ 700 700 10
IBAN DE86 7007 0010 0752 1933 00
BIC (SWIFT-Code) DEUTDEM1
V.A.T. Ident No. DE129515865
Tax Number 143/215/20392

**Organisationsmittel
und Visualisierungshilfen**



WEIGANG



WEIGANG MEDIA GmbH
PF 11 40 · Bahnhofstrasse 27 · 96104 Ebern

PROFIL G/BTR

Herr Knud Doberke
Bahnhofstrasse 18
97234 Weichenberg

Ihr zuständiger Berater:

WEIGANG MEDIA GmbH

Postfach 11 40 · TEL. 09531/61-65
96104 Ebern

R E C H N U N G

Bei Zahlung bitte angeben:
Kunden-Nr. Rechnungs-Nr. Rechnungsdatum

45036 404312 14.04.04

Vk-Gebiet U.Auftrags-Nr. U.Auftragsdatum

110020 3541244 19.03.04

Lieferanten-Nr. Lieferung ab Werk

45.03.04

Versandart:

OBERBRINGER

Packstücke 10 · Gewicht KG 0,0

Vertreter W-MEDIA 195 21kg! 0

Ihre Bestellzeichen Bestell datum

19.03.04

Sachbearbeiter: "MANJA WINCKELMANN"

Wir danken für Ihren Auftrag, den wir zu unseren umgeitigen Bedingungen ausgeführt und heute versandt haben.

Pos. Artikel-Nr.	Artikelbezeichnung	Menge · ME	Einheitspreis Euro /St	Gesamtpreis	Verbindl. Preis
------------------	--------------------	------------	------------------------	-------------	-----------------

1 5410127	URPREISERTHGT FRAUNHOFER INST. F. SILICATEF.	2.100 ST	0,90		
	1. EINLAGE: 5/5c 115G				
	2. EINLAGE: 2/2c 9UG				
	3. UMSCHLAG: 5/2c 30UG (3x) 21x29,7 CM				

WEIGANG Media GmbH
Steuernummer 257/184/86 222

✓

Bruttowarenwert 1.944,40,- € 1.944,40,- € 1.944,40,- € 1.944,40,- €

Netto-Warenwert 1.944,40,- € 1.944,40,- € 1.944,40,- € 1.944,40,- €

Abverkosten 0,00 0,00 0,00 0,00 0,00

Nettowert 1.944,40,- € 1.944,40,- € 1.944,40,- € 1.944,40,- €

Rest Kurs von Re-Bordumtrag Euro

ZAHLUNG: Innerhalb 30 Tagen netto oder bis 24.04.04

mit 2% Skonto - Europäergelt. Norm

Kontakt Sparkasse Ebern Kont. 318 547 002 733 317 30